

Planning to Protect:

Thinking About Climate Change and Adaptation

APA

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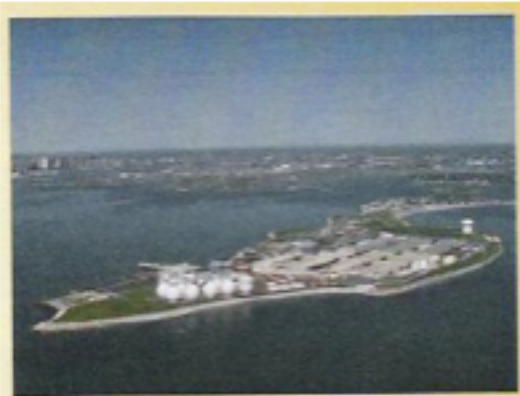
Key Messages

1. Climate change is here.
We are already observing change.
2. Climate change will have consequences for regions and the future will be different than the past. Specific local impacts will vary.
3. Decisions today can reduce vulnerability through anticipation and action.

Two Responses to a Changing Climate



Mitigation: reduce emissions; energy efficiency; alternative energies, etc.
Implementation: NOW and save money
Impacts on climate change: 50-100 yrs.



Adaptation: planning ahead;
incorporating likely future climate states into regular planning; taking action
Implementation: NOW and in future
Impacts on community: Now and Future.

There is a 3rd Possible
Response . . .



Community Context

Climate Change
not the only challenge
to be juggled



Communities Have:

- A lot to lose from climate impacts: slr, storms, water issues, health impacts, forest fires, etc.
- Limited resources and tight budgets: competition – elderly, economy, energy, environment
- Much to gain from opportunities: economic dev., energy savings, avoided costs
- Relevant authorities: blgd and dev permits (influence land use), building codes, public transit
- Opportunity to learn from and work with other communities

Adaptation

- No “top 10” Adaptation Actions
- Adaptations are location and issue specific
- Adaptive capacity is uneven w/in & across society: resources (\$, info., expertise); political will; stringent policies and regulations; not automatically translate into reduced vulnerability
- Scale of info must match scale of issue
- Rarely *only* because of climate change: multiple stressors (e.g. growing populations in harms’ way); hazard management
- Climate change - a moving target: requires continuous reassessment

Thinking About Possible Consequences

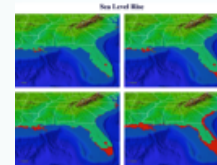
Many options:

- Learn from others: guidebooks and specific projects
- How will present situations, problems, hazards change under a changing climate?
- Examine various sectors under projected changes
 - Identify vulnerabilities
 - Define tipping points for actions

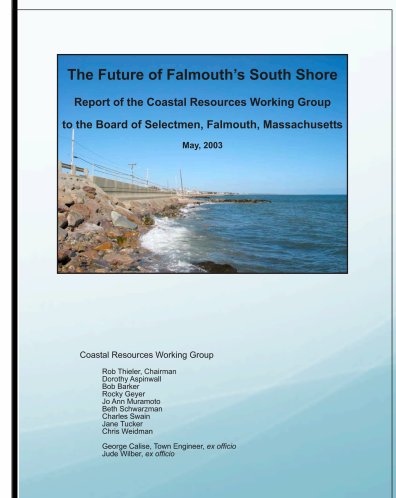
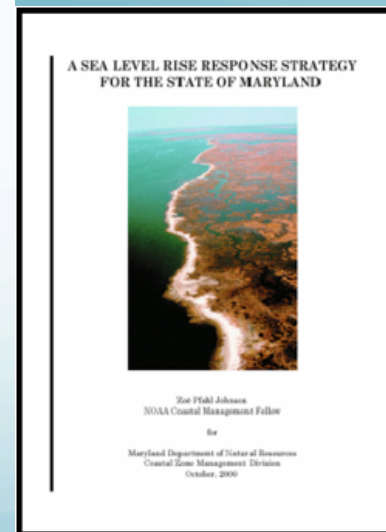


A Survey of Climate Change Adaptation Planning

Bill Perkins
Dennis Ojima



THE H. JOHN HEINZ III CENTER FOR SCIENCE,
ECONOMICS AND THE ENVIRONMENT

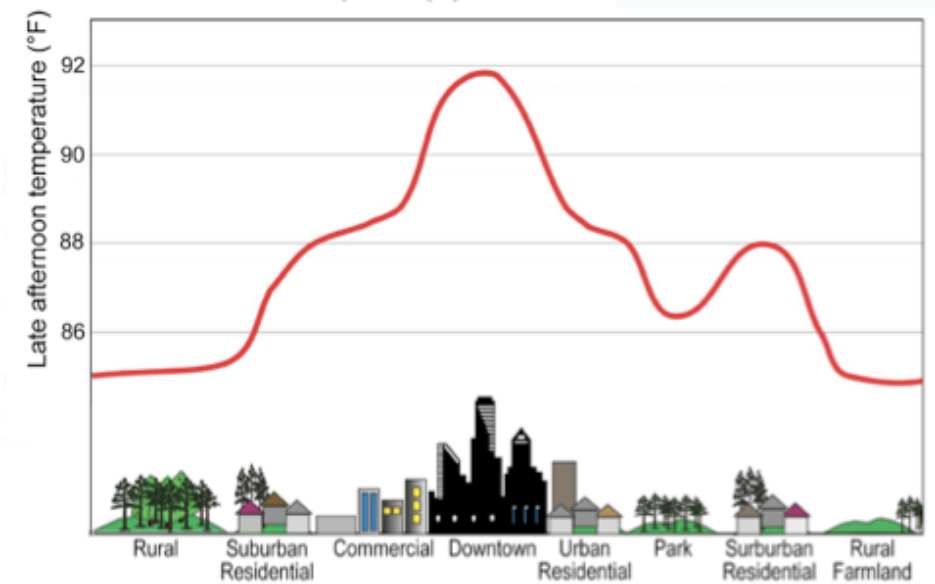
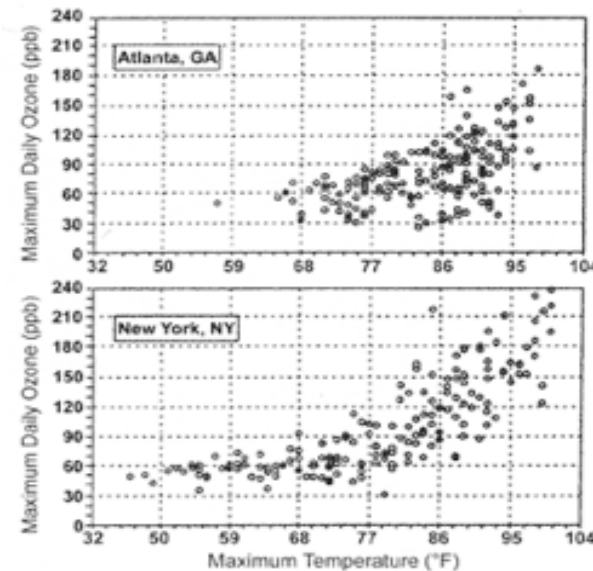


Present Problems Likely to Get Worse

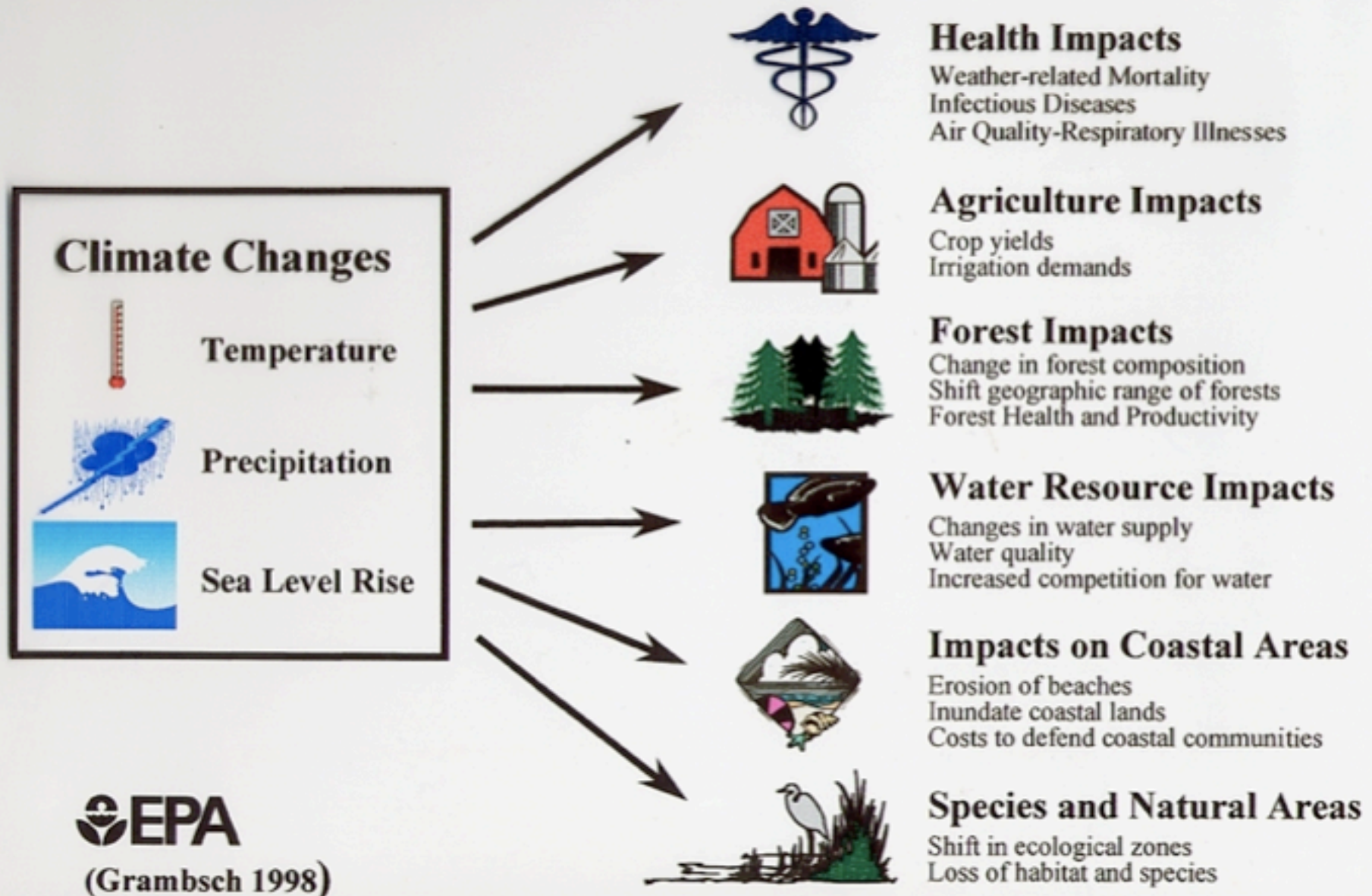
- **Urban Air Quality:** Relationship between temperature and air quality: Higher temps - more challenging to meet air quality standards
- **Urban Heat Island Effect:** Increased temperatures day and night – more heat held by urban areas
- **Rate of Sea-level Rise:** Relationship to water temperature and melting glaciers-> salt water intrusion, storm surge, flooding



From: Global Climate Impacts in the US, 2009



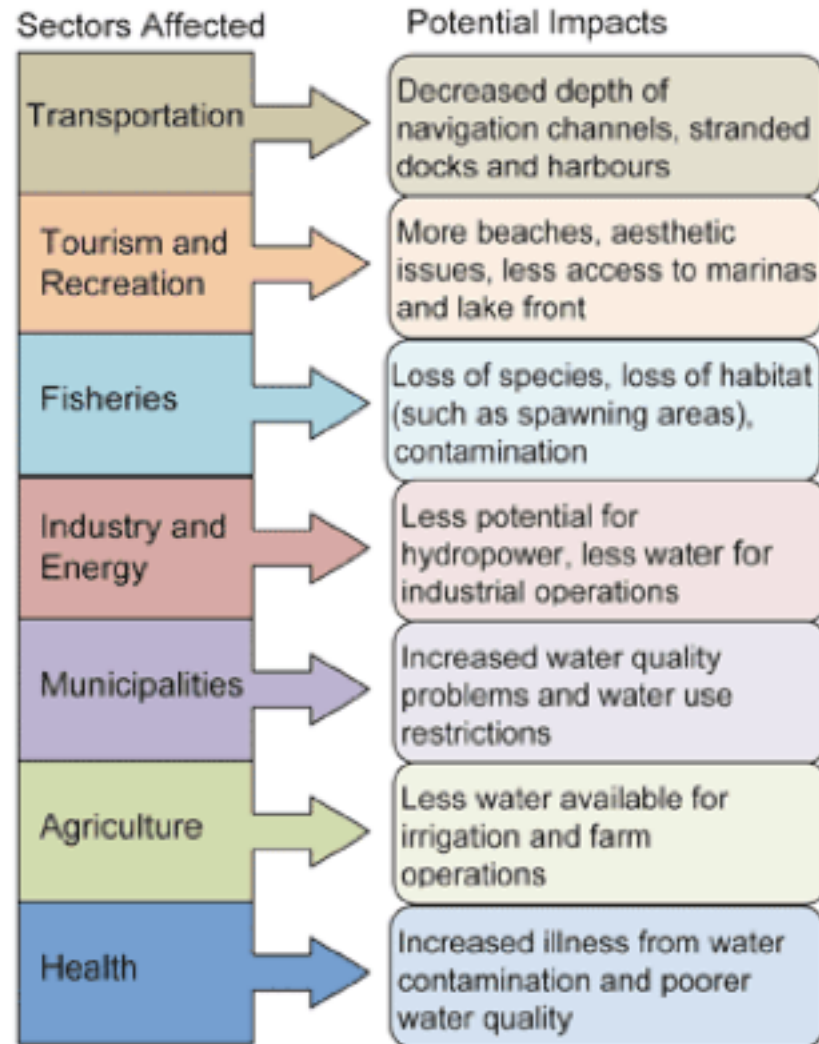
Potential Climate Change Impacts



Eg., Sectoral Impacts from Reduced Water Levels

Reduced water levels:
interconnected impacts across
many sectors, creating mismatches
between water supply and demand,
and necessitating trade-offs.

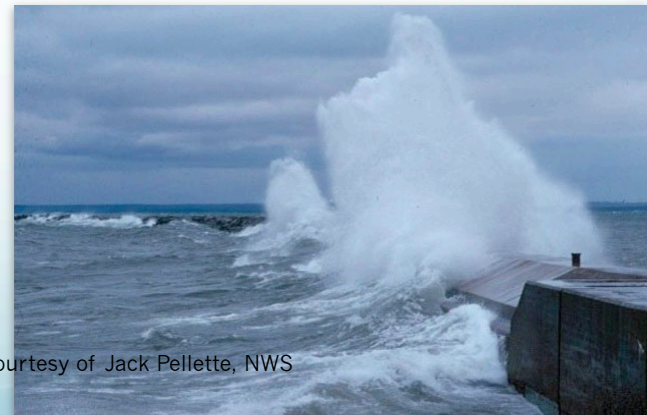
Regions outside the Midwest
will also be affected. For example,
a reduction in hydropower
potential would affect the
Northeast, and a reduction
in irrigation water would affect
regions that depend on
agricultural produce from
the Midwest.



Adaptation Example

Responding to Sea-Level Rise and Storm Surge

- Protect: build hard structures such as levees and dikes (although this can actually increase future risks by destroying wetlands and also by creating a false sense of security that causes more development in vulnerable areas)
- Accommodate rising water: elevate roads, buildings, and facilities; improve flood control structure design; enhance wetlands
- Retreat: accommodate inland movement through planned retreat; require setbacks for construction; improve evacuation planning.



Courtesy of Jack Pellette, NWS

Adaptation Example: Protect New Orleans Raised Levee



Adaptation Example: Accommodate

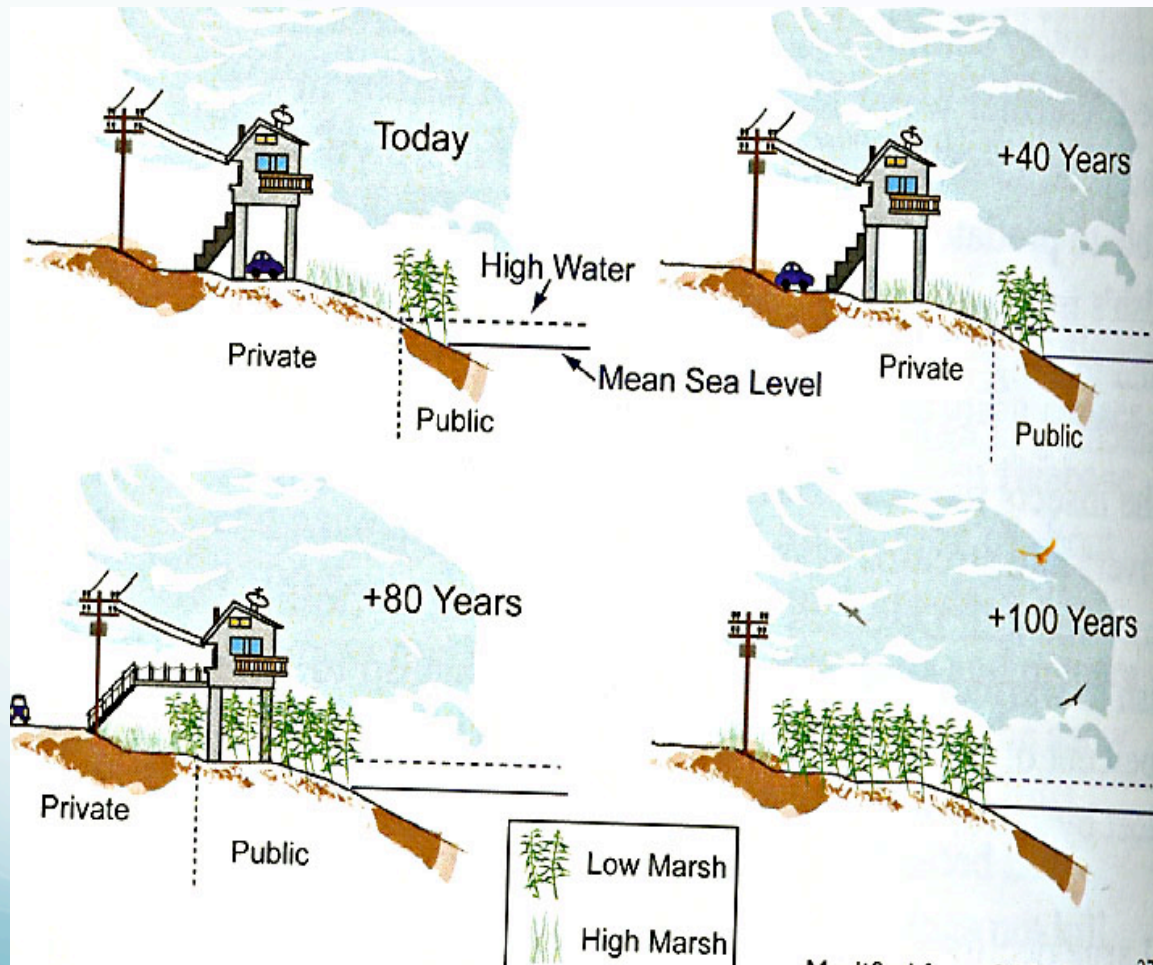
Raising a Sewage Treatment Plant in Boston

- Boston's Deer Island sewage treatment plant built 1.9 feet higher than it would have been - to account for future sea-level rise.
- The planners assessed what could be easily and inexpensively changed later, vs those things that would be more difficult and expensive to change later. So increased the plant's height, but will build protective barriers when needed.



Adaptation Example: Retreat

Preserving Coastal Wetlands



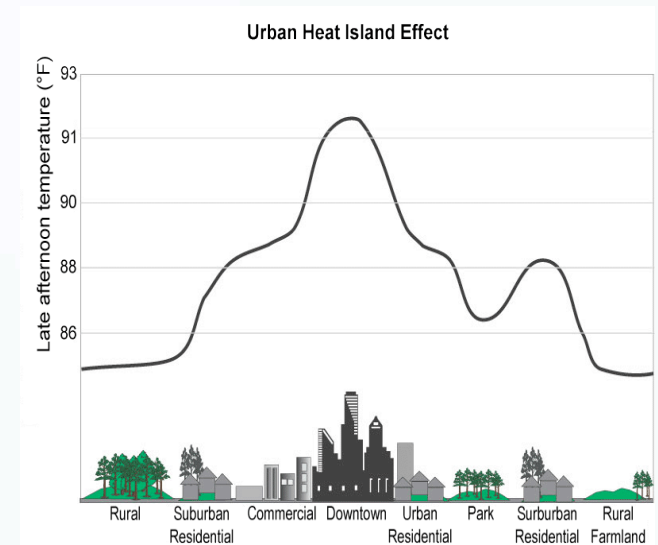
Rolling Easements:

Many states allow some development near shore – but no armoring, setbacks based on erosion rates, small & removable structures, etc.

Recognize nature's right-of-way to advance inland.

Adaptation Example: Heat waves

- Local weather service issues heat alerts
- Provide tips on how vulnerable people can protect themselves
- Use buddy system to check on elderly residents
- Public utilities voluntarily refrain from shutting off services for non-payment
- Extend hours for public cooling places
- Install reflective or green roofing and plant trees in urban areas to help cool urban heat island



“Green roofs” are cooler than the surrounding conventional roofs.

Adaptation Examples

Agriculture

- Switch to plant species that mature earlier and are more resistant to heat and drought
- Alter planting dates
- Increase crop and livestock diversity
- Minimize need for external inputs such as irrigation

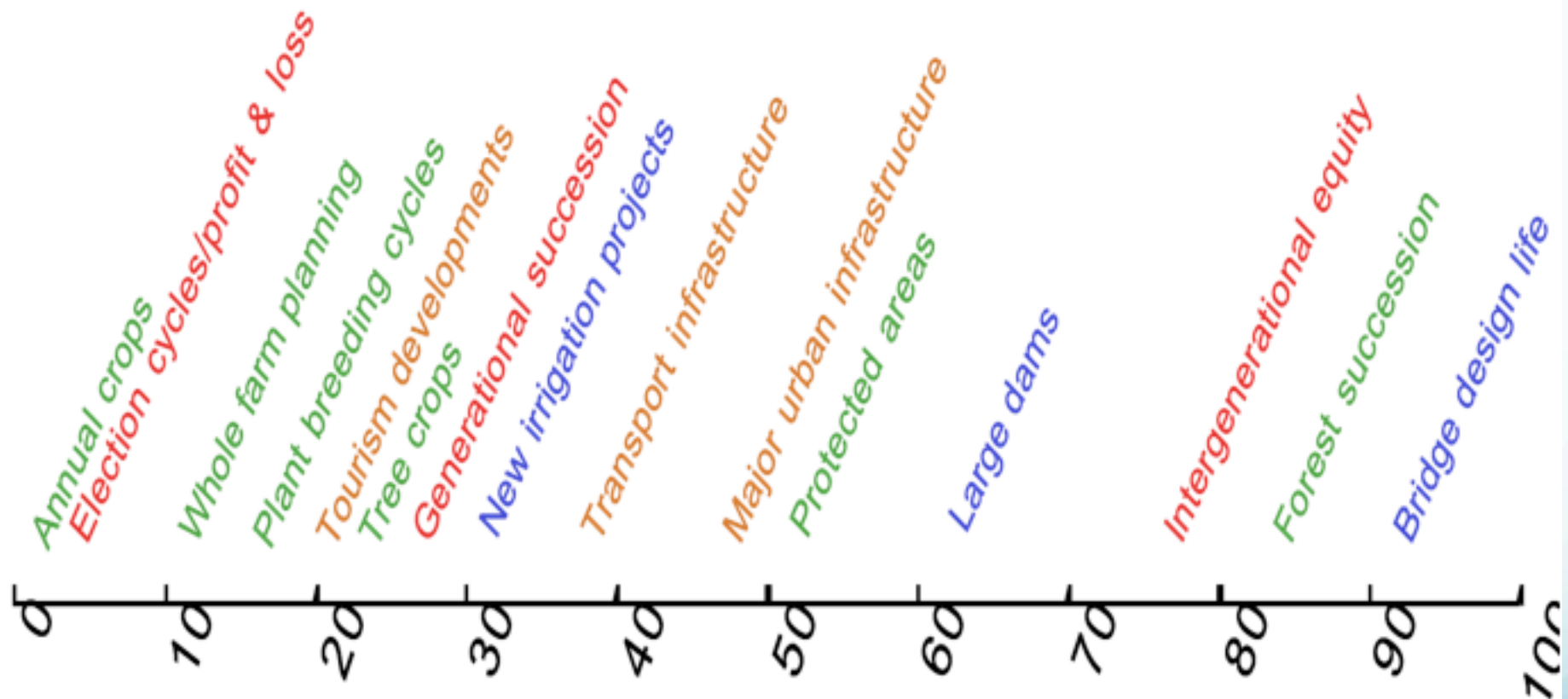


Fire due to drier conditions

- Thin trees and bushes near structures
- Select ignition-resistant building materials and design features
- Position structures away from slopes
- Develop emergency plans and evacuation procedures



Adaptation Planning: Many Timeframes



When To Act?

Pro-action or Reaction
Inaction or Action
all have consequences/costs

- Road Crossing Upgrade estimate \$56,000
- Engineer's estimate to Repair Road \$93,000
- Whitcomb Mill Road, NH

From M. Simpson, Antioch University



We can anticipate, plan, act...



or we can react.



- **Southern Climate Impacts Planning Program:** NOAA/RISA, LSU and OU, State Climatologists, Southern Regional Climate Center
- Stakeholder-driven research: regionally relevant scientific research that results in critical information, products, tools, and education
- Engagement: partners, decision makers, and other stakeholders
- Southern U.S.: TX, OK, MS, LA, AR, TN
- Focus multi-hazard preparedness: severe storms, droughts, floods, hurricanes, extreme temperatures, etc., and coastal impacts of climate change and variability.

Questions?

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<http://www.southernclimate.org>

www.adaptationnetwork.org

resources